

User manual

TIMER

SLC-457

- Firmware: v.1.02 or higher
- Input type: pulse
- Wall-mounted case IP 65 and IP 67



Read the user's manual carefully before starting to use the unit or software.
Producer reserves the right to implement changes without prior notice.

SPIS TREŚCI

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Explanation of symbols used in the manual:

- This symbol denotes especially important guidelines concerning the installation and operation of the device. Not complying with the guidelines denoted by this symbol may cause an accident, damage or equipment destruction.

IF THE DEVICE IS NOT USED ACCORDING TO THE MANUAL THE USER IS RESPONSIBLE FOR POSSIBLE DAMAGES.



- This symbol denotes especially important characteristics of the unit.
Read any information regarding this symbol carefully

1. BASIC REQUIREMENTS AND USER SAFETY



- **The manufacturer is not responsible for any damages caused by inappropriate installation, not maintaining the proper environmental conditions and using the unit contrary to its assignment.**
- Installation should be conducted by qualified personnel . During installation all available safety requirements should be considered. The fitter is responsible for executing the installation according to this manual, local safety and EMC regulations.
- GND input of device should be connected to PE wire;
- The unit must be properly set-up, according to the application. Incorrect configuration can cause defective operation, which can lead to unit damage or an accident.
- **If in the case of a unit malfunction there is a risk of a serious threat to the safety of people or property additional, independent systems and solutions to prevent such a threat must be used.**
- **The unit uses dangerous voltage that can cause a lethal accident. The unit must be switched off and disconnected from the power supply prior to starting installation of troubleshooting (in the case of malfunction).**
- Neighbouring and connected equipment must meet the appropriate standards and regulations concerning safety and be equipped with adequate overvoltage and interference filters.
- **Do not attempt to disassemble, repair or modify the unit yourself. The unit has no user serviceable parts. Defective units must be disconnected and submitted for repairs at an authorized service centre.**



- In order to minimize fire or electric shock hazard, the unit must be protected against atmospheric precipitation and excessive humidity.
- Do not use the unit in areas threatened with excessive shocks, vibrations, dust, humidity, corrosive gasses and oils.
- Do not use the unit in areas where there is risk of explosions.
- Do not use the unit in areas with significant temperature variations, exposure to condensation or ice.
- Do not use the unit in areas exposed to direct sunlight.
- Make sure that the ambient temperature (e.g. inside the control box) does not exceed the recommended values. In such cases forced cooling of the unit must be considered (e.g. by using a ventilator).



The unit is designed for operation in an industrial environment and must not be used in a household environment or similar.

2. GENERAL CHARACTERISTICS

Time counter type **SLC-457** is designed for time counting in range from 0 to 100 hours with resolution of 1 minute. Actual result is showed on 4-digit display, and the user can change it's bright in 8 steps range. The device is equipped with 4 buttons for main presets programming. To get high protection level, the keyboard is mounted under transparent waterproof cover. This feature allows to use **SLC-457** in hazardous environments.

To allow user to change presets without opening of cover, an IR sensor is mounted. Remote controller keyboard is equivalent to the device keyboard (Note, that remote controller is not a part of the **SLC-457** set. It is an option.).

Build in RS-485 communication interface enables remote access to all internal registers. Baud rate can be changed from 1200 to 115200 baud. **SLC-457** has additional sensor supply output, non separated, stabilized 24V DC $\pm 5\%$ / max. 100 mA.

3. TECHNICAL DATA

Power supply voltage (depending on version)	85... 230 ...260V AC/DC; 50 \div 60 Hz (separated)
External fuse (required)	19... 24 ...50V DC and 16... 24 ...35V AC (separated)
Power consumption	T - type, max. 2 A max. 11 VA @ 85 \div 260V AC/DC max. 11 VA @ 16V \div 35V AC max. 8 W @ 19V \div 50V DC
Pulse inputs (galvanic isolated)	
START input	counting enable (terminal no. 14)
REST input	clear counter (terminal no. 13)
COM	common terminal (terminal no. 15)
Input levels	
low:	0 V \div 3 V
high:	10 V \div 30 V (typically 12 mA @ 24 V)
Inputs sampling frequency	> 10kHz
Minimum time between input signals edges	500 μ s
Sensor supply output	24V DC $\pm 5\%$ / max. 100 mA;
Displaying values range	from 0 to 100 hours
Precision	$\pm 0,005\%$ of displayed value
Resolution	1 minute
Communication interface	RS 485, 8N1 / Modbus RTU, not separated
Baud rate	1200 bit/s \div 115200 bit/s
Display	LED, 4 x 57 mm; with 8-steps brightness regulation
Data memory	non-volatile memory, EEPROM type
Protection level	IP 67

Housing type	Wall mounted, T-type
Housing material	ABS + fibreglass
Housing dimensions	230 x 140 x 96,5 mm
Operating temperature	0°C to +50°C
Storage temperature	-10°C to +70°C
Humidity	5 to 90% no condensation
Altitude	up to 2000 meters above sea level
Screws tightening max. torque	0,5 Nm
Max. connection leads diameter	2,5 mm ²
Safety requirements	according to: PN-EN 61010-1 installation category: II pollution degree: 2 voltage in relation to ground: 300V AC insulation resistance: >20MΩ insulation strength between power supply and input/output terminal: 1min. @ 2300V
EMC	according to: PN-EN 61326-1



This is a class A unit. In housing or a similar area it can cause radio frequency interference. In such cases the user can be requested to use appropriate preventive measures.

4. DEVICE INSTALLATION

The unit has been designed and manufactured in a way assuring a high level of user safety and resistance to interference occurring in a typical industrial environment. In order to take full advantage of these characteristics installation of the unit must be conducted correctly and according to the local regulations.



- Read the basic safety requirements on page 3 prior to starting the installation.
- Ensure that the power supply network voltage corresponds to the nominal voltage stated on the unit's identification label.
- The load must correspond to the requirements listed in the technical data.
- All installation works must be conducted with a disconnected power supply.
- Protecting the power supply clamps against unauthorized persons must be taken into consideration.

4.1. UNPACKING

After removing the unit from the protective packaging, check for transportation damage. Any transportation damage must be immediately reported to the carrier. Also, write down the unit serial number on the housing and report the damage to the manufacturer.

Attached with the unit please find:

- user's manual,
- warranty,

4.2. ASSEMBLY



- Disconnect the power supply prior to starting assembly.
- Check the correctness of the performed connections prior to switching the unit on.



To install device on the wall, a pinholes should be made. Figure 4.1 presents dimensions of the device and distances between holes. The back side of the device has four mounting holes. This part of the case should be mounted to a wall by screws.

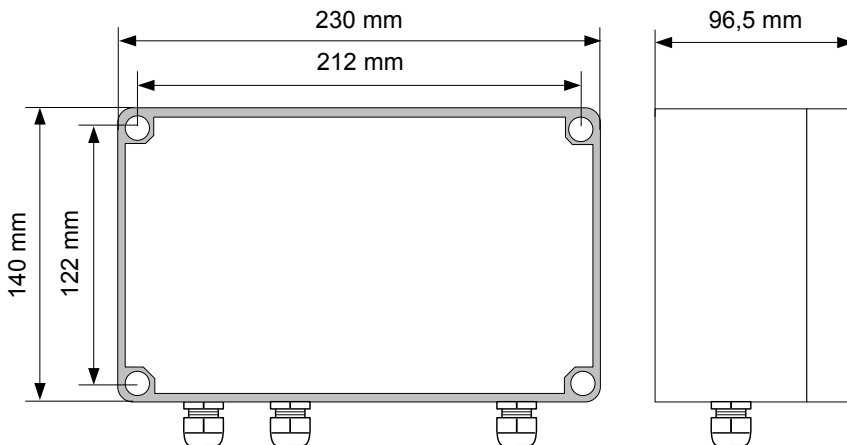


Figure 4.1. Device and assembly dimensions of T-type case

4.3. CONNECTION METHOD

Caution



- Installation should be conducted by qualified personnel . During installation all available safety requirements should be considered. The fitter is responsible for executing the installation according to this manual, local safety and EMC regulations.
- The unit is not equipped with an internal fuse or power supply circuit breaker. Because of this an external time-delay cut-out fuse with minimal possible nominal current value must be used (recommended bipolar, max. 2A) and a power supply circuit-breaker located near the unit. In the case of using a monopolar fuse it must be mounted on the phase cable (L).
- The power supply network cable diameter must be selected in such a way that in the case of a short circuit of the cable from the side of the unit the cable shall be protected against destruction with an electrical installation fuse.
- Wiring must meet appropriate standards and local regulations and laws.
- In order to secure against accidental short circuit the connection cables must be terminated with appropriate insulated cable tips.
- Tighten the clamping screws. The recommended tightening torque is 0.5 Nm. Loose screws can cause fire or defective operation. Over tightening can lead to damaging the connections inside the units and breaking the thread.
- In the case of the unit being fitted with separable clamps they should be inserted into appropriate connectors in the unit, even if they are not used for any connections.
- Unused clamps (marked as n.c.) must not be used for connecting any connecting cables (e.g. as bridges), because this can cause damage to the equipment or electric shock.
- If the unit is equipped with housing, covers and sealing packing, protecting against water intrusion, pay special attention to their correct tightening or clamping. In the case of any doubt consider using additional preventive measures (covers, roofing, seals, etc.). Carelessly executed assembly can increase the risk of electric shock.
- After the installation is completed do not touch the unit's connections when it is switched on, because it carries the risk of electrical shock.

Due to possible significant interference in industrial installations appropriate measures assuring correct operation of the unit must be applied. To avoid the unit of improper indications keep recommendations listed below.

- Avoid common (parallel) leading of signal cables and transmission cables together with power supply cables and cables controlling induction loads (e.g. contactors). Such cables should cross at a right angle.
- Contactor coils and induction loads should be equipped with anti-interference protection systems, e.g. RC-type.
- Use of screened signal cables is recommended. Signal cable screens should be

- connected to the earthing only at one of the ends of the screened cable.
- In the case of magnetically induced interference the use of twisted couples of signal cables (so-called "spirals") is recommended. The spiral (best if shielded) must be used with RS-485 serial transmission connections.
- In the case of measurement or control signals are longer than 30m or go outside of the building then additional safety circuits are required.
- In the case of interference from the power supply side the use of appropriate anti-interference filters is recommended. Bear in mind that the connection between the filter and the unit should be as short as possible and the metal housing of the filter must be connected to the earthing with largest possible surface. The cables connected to the filter output must not run in parallel with cables with interference (e.g. circuits controlling relays or contactors).

Connections of power supply voltage and input signals are executed using the screw connections on the back of the unit's housing (Figure 4.2 - 4.4).

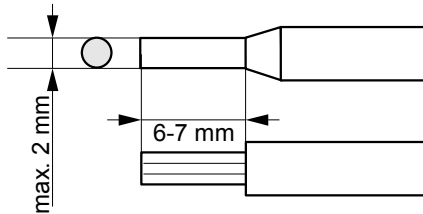


Figure 4.2. Method of cable insulation replacing and cable terminals

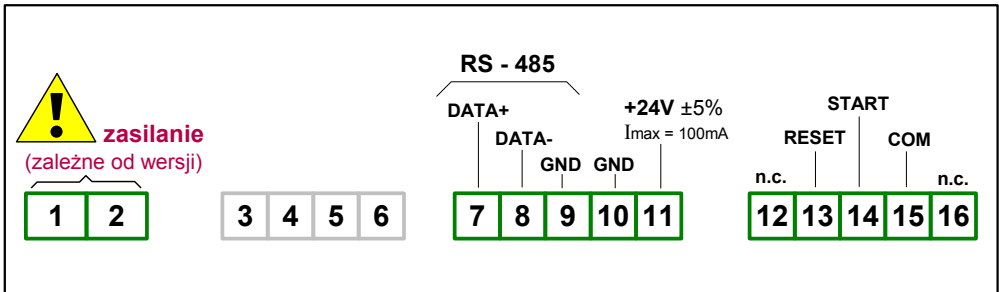


Figure 4.3. Terminals description

Description of input terminals

- { **START** } - counting enable (high logical level);
- { **RESET** } - counter clearing (rising logical edge);
- { **COM** } - common terminal



All connections must be made while power supply is disconnected !

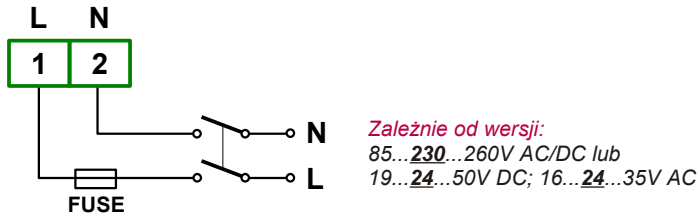


Figure 4.4. Connection of power supply

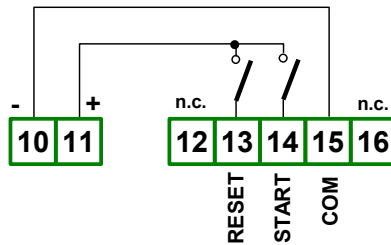


Figure 4.5. Connection of input terminals

4.4. MAINTENANCE

The unit does not have any internal replaceable or adjustable components available to the user. Pay attention to the ambient temperature in the room where the unit is operating. Excessively high temperatures cause faster ageing of the internal components and shorten the fault-free time of unit operation.

In cases where the unit gets dirty do not clean with solvents. For cleaning use warm water with small amount of detergent or in the case of more significant contamination ethyl or isopropyl alcohol.

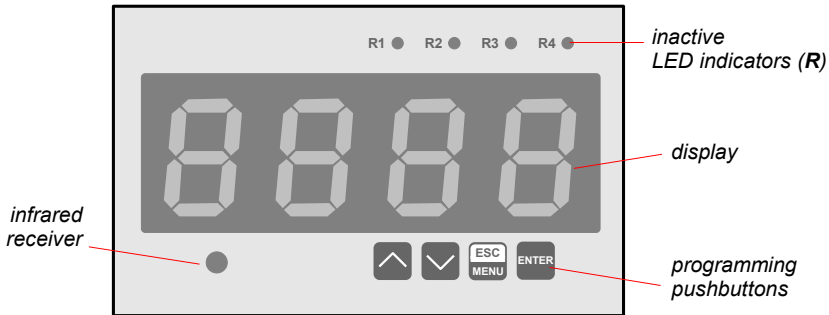


Using any other agents can cause permanent damage to the housing.



Product marked with this symbol should not be placed in municipal waste. Please check local regulations for disposal and electronic products.

5. FRONT PANEL DESCRIPTION



Symbols and functions of push-buttons:



Symbol used in the manual: **[ESC/MENU]**

Functions:

- Enter to main menu (press and hold by at least 2 sec.)
- Exit the current level and Enter to previous menu (or counting mode)
- Cancel the changes made in parameter being edited



Symbol used in the manual: **[ENTER]**

Functions:

- Start to edit the parameter
- Enter to the sub-menu,
- Confirmation of changes made in parameter being edited



Symbol used in the manual: **[^] [v]**

Functions:

- Change of the present menu,
- Modification of the parameter value,
- Change of the display mode.

6. PRINCIPLE OF OPERATION

After turning the power supply on, device ID and software version are showed on the display, next the controller goes to the counting mode. After that unit goes to counting mode, restoring counter value stored while power down.

6.1. TIME COUNTING MODE

In counting mode actual result is showed on the display. Result represents total time of high level on **{START}** input (in „HH.MM” format). Low level on **{START}** input pauses counting of time, without clearing of result. Next occur of high level on **{ START }** causes continuing of time counting (if result has not been cleared). Counting is signalled by blinking decimal point between displayed hours and minutes. Decimal point lights continuously while counting is paused.



If counter reaches 100 hours, warning message “**Over**” is displayed rather than current value. In such cases user should clear counter to continue counting.

Time counter can be cleared via „**rES**” option (from menu level) or electrically via { **RESET** } input (by delivering logical rising edge). To enable electrical clearing of the counter the „**rinP**” parameter (menu preset) must be set to „**on**” value.

All parameters (e.g. bright, transmission parameters) can be changed via programming menu (see: **DEVICE PROGRAMMING**) using local keyboard or IR remote controller, or externally using RS-485 interface.



Configuration of the device (via programming menu or RS-485 interface) do **not stops normal operation of the device (do not stops counting).**

7. DEVICE PROGRAMMING



Due to safety requirements, it is recommended to use IR remote controller for menu settings configuration. IR remote controller is available optionally as additional equipment.

The device menu allow user to set all parameters connected to operation of inputs, control modes, communication via RS-485 and access settings. The meaning of the particular parameters is described in paragraph **MENU DESCRIPTION**.

7.1. PROGRAMMING MENU

To enter main menu (being in the counting mode) operator must to press and hold at least 2 sec. [**ESC/MENU**] button.

If the user password is defined (see parameter “**Scod**”), operator have to enter correct one before proceeding to menu options . Entering of the passwords is similar to the edition of numeric parameters (see: **PARAMETERS EDITION**), however presently editing digit is showed only on the display, other digits are replaced by “-” sign.

After entering of last digit of the password first menu position will be displayed (if the password is correct) or warning “**Err**” in other case.

Functions of the buttons while sub-menu and parameters choice:



Selection of sub-menu or parameter for editing. Name of selected item (sub-menu or parameter) is displayed.



Operation of [**ENTER**] button depend on present menu position:

- if the name of some sub-menu is displayed - enter this sub-menu; name of the first parameter (or next level sub-menu) is displayed,
- if the name of some parameter is displayed - enter the edition of this parameter; present value of the parameter is displayed,



[ESC/MENU] button allow user to exit present menu level and goes to upper level menu (or counting mode).



After about 1 min. since last use of the buttons, device exits the menu mode and returns to the counting mode (only if no parameters are in editing mode).

7.2. PARAMETERS EDITION

To start edition of any parameter user should select name of desired one using **[^]** **[v]** buttons and then press **[ENTER]**.

7.2.1. Numeric parameters (digit change mode)

Numerical parameters are displayed as decimal numbers. The mode of its new value entering depends on chosen edit method (see parameter „Edit“).

In mode “by digit” („Edit“=“dig”) pressing one of the keys **[^]** or **[v]** causes change of current position (flashing digit) or the sign (+/-). Short pressing of the **[ENTER]** button causes change of the position (digit).

Press **[ENTER]** at least 2 seconds to accept the changes, after that question “Set?” is displayed, and user must to confirm (or cancel) the changes. To conform changes (and store it in EEPROM) press **[ENTER]** button shortly after “Set?” is displayed. To cancel the changes press **[ESC]** button shortly after “Set?” is displayed. After that device returns to the menu.

7.2.2. Numeric parameters (slide change mode)

In “slide change” mode („Edit“=“Slid”), buttons **[^]** and **[v]** has different functions.

To increase edited value press (or press and hold) **[^]** button only, the increasing became quickest as long as button **[^]** is pressed. To slow down the increasing, button **[v]** can be used. If **[v]** is pressed shortly (and button **[^]** is still pressed), increasing slow down for a moment only, if **[v]** is pressed and held while button **[^]** is still pressed the increasing slow down and will be kept on lower speed.

To decrease edited value press (or press and hold) **[v]** button only. The decreasing became quickest as long as button **[v]** is pressed. To slow down the decreasing, button **[^]** can be used. If **[^]** is pressed shortly (and button **[v]** is still pressed), decreasing slow down for a moment only, if **[^]** is pressed and held while button **[v]** is still pressed the decreasing slow down and will be kept on lower speed.

Press **[ENTER]** at least 2 seconds to accept the changes, after that question “Set?” is displayed, and user must to confirm (or cancel) the changes. To conform changes (and store it in EEPROM) press **[ENTER]** button shortly after “Set?” is displayed. To cancel the changes press **[ESC]** button shortly after “Set?” is displayed. After that device returns to the menu.

7.2.3. Switch parameters (“LIST” type)

Switch parameters can be described as a sets of values (a lists) out of which only one of the options available on the list can be selected for the given parameter. Options of switching parameter are selected using **[^]**, **[v]** keys.

Short pressing of **[ENTER]** causes in displaying of the acknowledge question (“Set?”). If key **[ENTER]** is pressed again, the changes are accepted, stored in EEPROM and the edition process finished. Pressing the key **[ESC]** after “Set?” causes in cancelling of made changes and returning to menu.

Functions of buttons when editing numeric and switching parameters:

While editing numeric parameter:

- change of current (flashing) digit
- slide change of value (acceleration, deceleration, direction change)

While editing switch parameter - selection of switch parameter.



If numerical parameter is being edited, a short press of **[ENTER]** button change edited position. A long press of **[ENTER]** button (at least 2 sec.) causes of display a **"Set?"** ask, which allow user to make sure if change of the parameter value is correct. If switch parameter is being edited, a short press of **[ENTER]** button causes of display a **"Set?"** ask. When **[ENTER]** button is pressed again (while **"Set?"** is displayed) the new value of the parameter is stored in EEPROM memory.



Pressing this button operator can cancel the changes done up to now (if they were not approved by **[ENTER]** button after the **"Set?"** ask) and come back to menu

7.3. MENU DESCRIPTION

"- - -"

Password checking. If any password different from **"0000"** is set, than every enter to main menu follows the entering of password. If entered password is correct first menu position will be displayed else warning **"Err"**, and unit returns to counting mode.



Due to problem with direct displaying of **"m"** letter, it is exchanged with special sign **"̣"**. Independently in user manual letter **"m"** is used to make it more readable (example: **"modE"**).

7.3.1. Option "rES"

This option allows clearing of time counter. After entering this option (press **[ENTER]**) device displays ask: **"cLr ?"**. If user press **[ENTER]** button again then counter will be cleared. If user press any other button then device will return to main menu without clearing.

7.3.2. Option "rinP"

This parameter allows activation of remote clearing via **{ RESET }** input. If it is set to value **"on"**, then it is possible to clear counter by delivering of logical rising edge on **{ RESET }** input. If this parameter is set to value **"oFF"** then **{ RESET }** input is inactive.

7.3.3. "rS" menu

This menu is connected with RS-485 interface, and sets his properties:

"Addr" - this parameter defines the address of the device, accordingly to Modbus protocol. It can be set in range from 0 to 199. If the value 0 is set then device, responds to frames with address 255 (FFh).

"bAud" - this parameter determines RS-485 interface baud rate. It can be set to one of 8 possible values: **"1.2"**, **"2.4"**, **"4.8"**, **"9.6"**, **"19.2"**, **"38.4"**, **"57.6"**, **"115.2"**, which respond to the baud rates of 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200 bit/s respectively.

"mbAc" - this parameter sets the access to the configuration registers of the device. Possible values:

"on" - configuration registers can be set via RS-485 interface,

"oFF" - configuration registers can not be set via RS-485 interface.

"rESP" - this parameter defines minimal (additional) delay between the Modbus message and the answer of the device (received and sent via RS-485 interface). This additional delay allows the device to work with poor RS-converters which do not works properly on baud rates higher than 19200. This parameter can be set to one of values:

"Std" - answer as quick as possible, no additional delay

" 10c"

" 20c"

" 50c"

"100c"

"200c"

- answer delayed of 10, 20, 50, 100 of 200 chars respectively, where one character time depends on selected baud rate



In the most cases parameter **"rESP"** should be set to **"Std"** (no additional delay). Unfortunately for some third party RS-converters **"rESP"** should be adjusted experimentally. Table below contains most frequently used values.

"bAud" parameter	"38.4"	"57.6"	"115.2"
"rESP" parameter	" 10c"	" 20c"	" 50c"

Tab.7.1. Settings of "rESP" parameter

7.3.4. "bri" parameter

This parameter allows user to set bright of the LED display, bright can be set to conventional values from 1 to 8.

7.3.5. "Scod" parameter

User password (4-digits number). If this parameter is set at value **"0000"**, user password is turned off.

If the user do not remember his password, the access to the menu is possible by the “one-use password”. To get this password please contact with Marketing Division. “Single use password” can be used only one time, after that it is destroyed. Entering this password causes in clearing of user password, it means sets the user password to „0000”.



The “one-use password” can be used **ONE TIME ONLY**, it is impossible to use it again! The “one-use password” can be restored by Service Division only.

7.3.6. "Edit" parameter

This parameter allows to change the edition mode of numerical parameters:

- "dig"** - the change to “by digit” mode,
- "Slid"** - slide change mode.

7.3.7. "dEFS" parameter

This setting allows to restore the factory settings of the device. To get the access to this option special password is required: „5465”, next the device displays acknowledge question „Set?”. Press **[ENTER]** to acknowledge the restoring of factory settings or **[ESC]** to cancel.



8. THE MODBUS PROTOCOL HANDLING

Transmission parameters: 1 start bit, 8 data bits, 1 stop bit, no parity control
 Baud rate: selectable from: 1200 to 115200 bits/second
 Transmission protocol: MODBUS RTU compatible

The device parameters and display value are available via RS-485 interface, as HOLDING-type registers (numeric values are given in U2 code) of Modbus RTU protocol. The registers (or groups of the registers) can be read by 03h function, and wrote by 06h (single registers) or 10h (group of the registers) accordingly to Modbus RTU specification. Maximum group size for 03h and 10h functions can not exceeds 5 registers (for single frame).



The device interprets the broadcast messages, but then do not sends the answers.

8.1. LIST OF REGISTERS

Register	Write	Range	Register description
01h	Yes		Counter value expressed in minutes. Range from 0 to 100 hours (60000 minutes). Write of any value to this register clears counter.
02h	Yes		Counter value („hours.minutes”, decimally): Value of this register equals hours*100+minutes, e.g. 310 decimally means 3 hours, and 10 minutes. Write of any value to this register clears counter.
10h	Yes	0 ÷ 199	”rinP” parameter (activation of { RESET } input)
11h	Yes	0 ÷ 7	”bri” parameter (display bright)
20h ¹	Yes	0 ÷ 199	Device address
21h	No	009Fh	Device ID
22h ²	Yes	0 ÷ 7	”bAud” parameter in ”rS” menu (baud rate): 0 - 1200 bit/sec.; 1 - 2400 bit/sec.; 2 - 4800 bit/sec.; 3 - 9600 bit/sec.; 4 - 19200 bit/sec.; 5 - 38400 bit/sec.; 6 - 57600 bit/sec.; 7 - 115200 bit/sec.
23h	Yes	0 ÷ 1	”mbAc” parameter in ”rS” menu (remote access to configuration registers); 0 – access disabled; 1 – access enabled
25h	Yes	0 ÷ 5	”rESP” parameter in ”rS” menu (additional delay): 0 – no additional delay; 1 - option ”10c”; 2 - option ”20c”; 3 - option ”50c”; 4 - option ”100c”; 5 - option ”200c”;
2Fh	Yes	0 ÷ 1	”Edit” parameter (numerical parameters edit mode); 0 - „dig” mode; 1 - „SLid” mode

- 1 - after writing to register no 20h the device responds with an ”old” address in the message.
- 2 - after writing to register no 22h the device responds with the new baud rate.

8.2. TRANSMISSION ERRORS DESCRIPTION

If an error occurs while write or read of single register, then the device sends an error code according to Modbus RTU specifications (example message no 5).

Error codes:

01h - illegal function (only functions 03h, 06h and 10h are available),

02h - illegal register address

03h - illegal data value

8.3. EXAMPLES OF QUERY/ANSWER FRAMES

Examples apply for device with address 1. All values are represent hexadecimal.

Field description:

ADDR Device address on modbus network

FUNC Function code

REG H,L Starting address (address of first register to read/write, Hi and Lo byte)

COUNT H,L No. of registers to read/write (Hi and Lo byte)

BYTE C Data byte count in answer frame

DATA H,L Data byte (Hi and Lo byte)

CRC L,H CRC error check (Hi and Lo byte)

1. Read of ID code

ADDR	FUNC	REG H,L		COUNT H,L		CRC L,H	
01	03	00	21	00	01	D4	00

The answer:

ADDR	FUNC	BYTE C	DATA H,L		CRC L,H	
01	03	02	00	9F	F8	2C

DATA - identification code (009Fh)

2. Change of the device address from 1 to 2 (write to reg. 20h)

ADDR	FUNC	REG H,L		DATA H,L		CRC L,H	
01	06	00	20	00	02	09	C1

DATA H - 0

DATA L - new device address (2)

The answer (the same as the message):

ADDR	FUNC	REG H,L		DATA H,L		CRC L,H	
01	06	00	20	00	02	09	C1

3. Get counter value in „hh.mm” format (register 02h)

ADDR	FUNC	REG H,L		COUNT H,L		CRC L,H	
01	03	00	02	00	01	25	CA

Device response:

ADDR	FUNC	BYTE C	DATA H,L		CRC L,H	
01	03	02	04	D2	3A	D9

DATA H, L - 04D2h = 1234, counter value „12.34” (12 hours, 34 minutes)

4. Try to write improper value to register 22h (baud rate).

ADDR	FUNC	REG H,L		DATA H,L		CRC L,H	
01	06	00	22	00	09	E9	C6

DATA L - DATA L – value exceeds allowable range (from 0 to 7)

The answer (if an error occur):

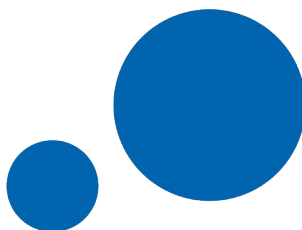
ADDR	FUNC	ERR	CRC L,H	
01	86	03	02	61



There is no full implementation of the Modbus Protocol in the device. The functions presented above are available only.

9. DEFAULT AND USER'S SETTINGS LIST

Parameter	Description	Default value	User's value	Desc. page
rinP	Activation of {RESET} input	oFF		13
RS 485 interface configuration ("rS" menu)				
Addr	Device address	0		13
bAud	Baud rate	9.6		14
mbAc	Blocking of access to the configuration registers	on		14
rESP	Additional delay of answer transmission	Std		14
Display parameters				
bri	Display brightness	bri6		14
Configuration of numerical parameters edition				
Edit	Numerical parameters edit mode	dig		15



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